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## THE EASTERN REGIONAL RESEARCH LABORATORY

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### NEW AND EXTENDED OUTLETS FOR FARM CROPS IS MAIN OBJECTIVE OF NEW PHILADELPHIA LABORATORY

**O**N A 32-acre tract of land in Wyndmoor, Pennsylvania, just outside the Philadelphia city limits, is located the new Eastern Regional Research Laboratory of the U. S. Department of Agriculture. This research laboratory is one of four similar institutions created by an act of Congress in 1938 to search for new uses and new and extended outlets and markets for surplus farm crops. The other laboratories are located at Peoria, Illinois; New Orleans, Louisiana; and Albany, California. The establishment of the four regional laboratories is only part of the general plan of attack on the surplus problems of American agriculture that have developed to such an acute state in recent years.

For many years before the World War American agriculture was geared to supply a substantial foreign demand, as well as a rapidly expanding domestic market. In this period the United States was accustomed to sell abroad about 150 to 200 million bushels of wheat, 8 to 9 million bales of cotton, and well toward a billion pounds of pork. During the World War, prices and production were greatly stimulated and agriculture greatly expanded. Quite naturally, agricultural research of that period was directed largely toward production problems, that is, to make two ears of corn grow where only one grew before.

During the period of deflation following the war and the accompanying crash in commodity prices, farm products and other raw materials were hard hit, and American wheat, pork, and cotton piled up on the farms and in trade channels. At the producing end there has been a great increase in the output of farms per hour of labor, per acre, and per animal unit. Unfortunately the full fruit of all this remarkable advancement in agricultural productivity was realized at the very time when the accustomed channels of consumption were changed and disrupted, and the increased supplies on a shrunken market meant lower prices and great distress to farmers. While there should be no regrets that the application of science and scientific methods have resulted in production of an abundance of food and fiber to feed and clothe the American people, neverthe-

less it should be recognized that the accumulation each year of vast surpluses of certain crops presents a problem that must receive attention. Greater diversification of uses is needed to stimulate movement of these excess crops as well as to find more profitable outlets for some of the lower-grade products.

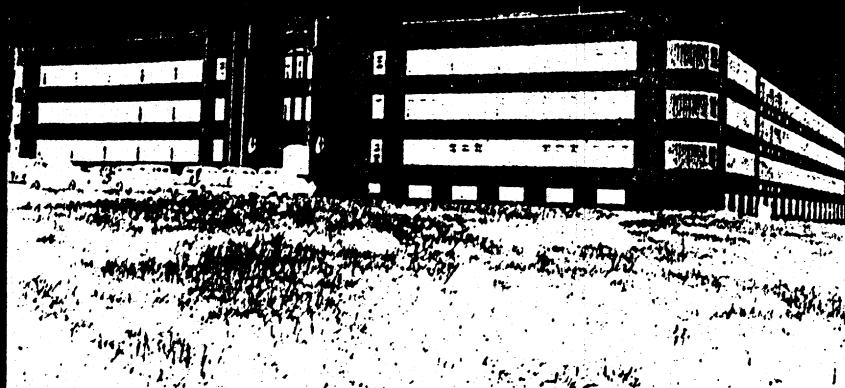
The research program of the regional laboratories was designed to place special emphasis on industrial uses for farm crops rather than food uses. It was felt that greater possibilities for increased outlets existed here, since human capacity for consuming food is limited, while capacity to use products of industry or manufactured goods is virtually limitless. Traditionally the farmer has produced the raw materials for food, clothing, and shelter. This is still his main business, but modern civilization also provides a rapidly expanding market for other kinds of goods, ranging from cosmetics to airplanes. Industrial uses based on these new or secondary human needs offer greatest promise of increased outlets for farm commodities.

The full catalog of present industrial uses of products of the farm attains a really impressive figure. From the standpoint of amounts, however, these are still comparatively small outlets for most farm products. Only about 3 per cent of the corn crop is used for purposes other than human food or animal feed. Not much more than 1 per cent of our milk production is used to make casein, lactose, and lactic acid. All industrial uses of soybeans consume only a small per cent of the crop.

There are two broad reasons why the expanding and diversifying material wealth of mankind has been created to a large degree from raw materials other than farm products. One is that too often the farm product has cost too much to be a competitor. The other is that physics and chemistry have found it easier to deal with relatively simple benzene derivatives from coal tar, the light hydrocarbons from petroleum, the minerals, and the simplest nitrogen compounds. Brilliant achievements have resulted from exhaustive study of these simple raw materials. Progress toward comparable achievement with starch, proteins, sugars, oils, cellulose, and other constituents of typical farm products has been less spectacular, due partly at least to limited knowledge of the chemistry and physics of these complex substances. A realistic program intended to expand industrial utilization of farm products will attack both of these major obstacles to further progress—high cost and limited knowledge. These two are not necessarily independent; high cost may be the result of limited knowledge.

Authority to establish the regional laboratories is contained in the Agricultural Adjustment Act of 1933, Sec. 202 (a) to (e) inclusive. This Act states that:

"The Secretary is hereby authorized and directed to establish, equip,



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The building is composed of three units. The front unit is devoted to administrative offices, the library, and other general services. One wing comprises chemical and physical laboratories and the other wing is equipped for pilot-plant development work. The floor area totals 179,000 square feet.

and maintain four regional research laboratories, one in each major farm producing area, and at such laboratories to conduct researches into and to develop new scientific and technical uses and new and extended markets and outlets for farm commodities and products and by-products thereof. Such research and development shall be devoted primarily to those farm commodities in which there are regular or seasonal surpluses . . . ."

The first year's allocation for the four laboratories was 4,000,000 dollars; the second year's \$3,200,000; and the third year's \$3,000,000. If future appropriations should continue on this scale, say \$750,000 to \$1,000,000 for each laboratory, the scientific staff of each will number from 150 to 200, mostly chemists, physicists, biologists, and technologists who are specialists in various industries.

Before the laboratories were established a very extensive survey was conducted to determine their locations and the scope of the investigations to be made, to obtain suggestions for needed research, and to coordinate the research work now being carried on. This included a study of the research projects of the Department of Agriculture and other Federal agencies, the state experiment stations, educational institutions, privately endowed research institutions, and the research laboratories maintained by industries which are based wholly or in part on utilization of agricultural raw material.

The laboratory building is a U-shaped structure of three stories and

basement. Offices, library, and conference rooms are in the 211-foot base of the "U," which is the front of the building. One of the wings contains research laboratories equipped for work in chemistry, physics, and microbiology. The other contains a small number of laboratories and a large space for pilot-plant equipment and chemical engineering research. Service shops and special research rooms are located in the basement. Both the offices and the laboratories are air-conditioned. Altogether the building contains 72 research laboratories in addition to the pilot plant and special research rooms in the basement. Pilot plant research will be stressed in this new program. One entire wing, or roughly one-third, of the laboratory building is being utilized for pilot-plant work. The laboratories are for the most part arranged in three-bay units, consisting of two laboratories with utility room and small office between.

The research work is divided between seven major research divisions. Initially the work of the Carbohydrate Division deals largely with research on utilization of lactose and white potatoes. The Protein Division is studying the utilization of casein and other milk proteins in addition to conducting investigations of the basic composition and properties of proteins. The Biochemical Division's main efforts are directed toward finding new and extended outlets for vegetables, apples, and tobacco. The Oil and Fat Division is carrying on studies on the chemistry, structure, and properties of the animal fat glycerides with the view of developing new products from animal fats and oils. Quality and stability studies on animal fats and oils, including lard, to aid in developing new and improved methods of production, processing and preservation are also being pursued. The Hides, Tanning Materials, and Leather Division is investigating tanning materials, methods of curing skins, and the treating, tanning, and finishing of leather. The Analytical and Physical Chemistry Division conducts general routine chemical and physical analyses for the other divisions, in addition to carrying on specialized physical, chemical, and physio-chemical testing and investigations of the commodities assigned to the laboratory. Pilot-plant studies of laboratory processes and products and commodity development research are conducted by the Chemical Engineering and Development Division.

The Eastern Regional Laboratory building was occupied in August, 1940, and most of the individual laboratories are now fully equipped. Staffing of the laboratory is expected to be virtually complete by the end of the present calendar year. All positions come under the U. S. Civil Service system.

Chemists and other scientists attending the American Chemical Society meeting in Atlantic City are cordially invited to stop in Philadelphia and visit the laboratory, to inspect its facilities, and to consult with members of the staff.